

Substitute Form PTO-1449 (Modified)	U.S. Department of Commerce Patent and Trademark Office	Attorney's Docket No. 07678-025001	Application No. <u>09/893,820</u> 09/398,395
Information Disclosure Statement by Applicant (Use several sheets if necessary) (37 CFR §1.98(b))		Applicant Joseph Chappell et al.	
		Filing Date September 17, 1999	Group Art Unit 1646 1631

1cc21 U.S. PTO
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U.S. Patent Documents

Examiner Initial	Desig. ID	Patent Number	Issue Date	Patentee	Class	Subclass	Filing Date If Appropriate
	AA						
	AB						
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						
	AK						

Foreign Patent Documents or Published Foreign Patent Applications

Examiner Initial	Desig. ID	Document Number	Publication Date	Country or Patent Office	Class	Subclass	Translation	
							Yes	No
LAC	BA	WO 96/36697	11/21/96	PCT				
LAC	BB	WO 97/38703	10/23/97	PCT				
	BC							
	BD							
	BE							

Other Documents (include Author, Title, Date, and Place of Publication)

Examiner Initial	Desig. ID	Document
LAC	CA	Lesburg et al., <u>Current Opinion in Structural Biology</u> , 1998, 8:695-703

Examiner Signature <i>Lois A. Clow</i>	Date Considered 30 March 2003
EXAMINER: Initials citation considered. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.	

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LAC	AA	5,589,619	12/31/96	Chappell et al.			
	AB	5,824,774	10/20/98	Chappell et al.			
	AC	5,849,526	12/15/98	Pichersky			
	AD	5,871,988	02/16/99	Croteau et al.			
	AE	5,876,964	03/02/99	Croteau et al.			
	AF	5,891,697	04/06/99	Croteau et al.			
	AG	5,981,843	11/09/99	Chappell et al.			
✓	AH	5,994,114	11/30/99	Croteau et al.			
LAC	AI	6,008,043	12/28/99	Croteau et al.			

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							Yes	No
LAC	AJ	WO 95/11913	05/04/95	PCT				
	AK	WO 97/15584	05/01/97	PCT				
	AL	WO 97/38571	10/23/97	PCT				
	AM	WO 99/02030	01/21/99	PCT				
	AN	WO 99/15624	04/01/99	PCT				
	AO	WO 99/18118	04/15/99	PCT				
	AP	WO 99/19460	04/22/99	PCT				
	AQ	WO 99/37139	07/29/99	PCT				
✓	AR	WO 99/38957	08/05/99	PCT				
LAC	AS	EP 0 768 381	04/16/97	European				

Other Documents (include Author, Title, Date, and Place of Publication)

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LAC	AT	Starks et al., "Structural Basis for Cyclic Terpene Biosynthesis by Tobacco 5-Epi-Aristolochene Synthase," <u>Science</u> , 1997, 227:1815-1820.
LAC	AU	Chappell, "The Biochemistry and Molecular Biology of Isoprenoid Metabolism," <u>Plant Physiol.</u> , 1995, 107:1-6.

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L4C	AV	Facchini et al., "Gene family for an elicitor-induced sesquiterpene cyclase in tobacco," <u>Proc. Natl. Acad. Sci. USA</u> , 1992, 89:11088-11092.
	AW	Corey et al., "Isolation of an <i>Arabidopsis thaliana</i> gene encoding cycloartenol synthase by functional expression in a yeast mutant lacking lanosterol synthase by the use of a chromatographic screen," <u>Proc. Natl. Acad. Sci. USA</u> , 1993, 90:11628-11632.
	AX	Bohlmann et al., "Terpenoid-based defenses in conifers: cDNA cloning, characterization, and functional expression of wound-inducible (E)- α -bisabolene synthase from grand fir (<i>Abies grandis</i>)," <u>Proc. Natl. Acad. Sci. USA</u> , 1998, 95:6756-6761.
	AY	Colby et al., "Germacrene C synthase from <i>Lycopersicon esculentum</i> cv. VFNT Cherry tomato: cDNA isolation, characterization, and bacterial expression of the multiple product sesquiterpene cyclase," <u>Proc. Natl. Acad. Sci. USA</u> , 1998, 95:2216-2221.
	AZ	Devarenne et al., "Molecular Characterization of Tobacco Squalene Synthase and Regulation in Response to Fungal Elicitor," <u>Arch. Biochem. Biophys.</u> , 1998, 349(2):205-215.
	BA	Back et al., "Cloning and Bacterial Expression of a Sesquiterpene Cyclase from <i>Hyoscyamus muticus</i> and Its Molecular Comparison to Related Terpene Cyclases," <u>J. Biol. Chem.</u> , 1995, 270(13):7375-7381.
	BB	Yin et al., "Regulation of Sesquiterpene Cyclase Gene Expression - Characterization of an Elicitor- and Pathogen-Inducible Promoter," <u>Plant Physiol.</u> , 1997, 115:437-451.
	BC	Mathis et al., "Pre-Steady-State Study of Recombinant Sesquiterpene Cyclases," <u>Biochemistry</u> , 36(27):8340-8348.
	BD	Back et al., "Identifying functional domains within terpene cyclases using a domain-swapping strategy," <u>Proc. Natl. Acad. Sci. USA</u> , 1996, 93:6841-6845.
	BE	Newman et al., "Characterization of the TAC box, a <i>cis</i> -element within an elicitor-inducible sesquiterpene cyclase promoter," <u>Plant J.</u> , 1998, 16(1):1-12.
	BF	Crock et al., "Isolation and bacterial expression of a sesquiterpene synthase cDNA clone from peppermint (<i>Mentha x piperita</i> , L.) that produces the aphid alarm pheromone (E)- β -farnesene," <u>Proc. Natl. Acad. Sci. USA</u> , 1997, 94:12833-12838.
	BG	Wildung et al., "A cDNA Clone for Taxadiene Synthase, the Diterpene Cyclase That Catalyzes the Committed Step of Taxol Biosynthesis," <u>J. Biol. Chem.</u> , 1996, 271(16):9201-9204.
	BH	Chen et al., "Cloning, Expression, and Characterization of (+)- δ -Cadinene Synthase: A Catalyst for Cotton Phytoalexin Biosynthesis," <u>Arch. Biochem. Biophys.</u> , 1995, 324(2):255-266.
	BI	Bohlmann et al., "Plant terpenoid synthases: Molecular biology and phylogenetic analysis," <u>Proc. Natl. Acad. Sci. USA</u> , 1998, 95:4126-4133.
	BJ	Cane et al., "Trichodiene Synthase. Substrate Specificity and Inhibition," <u>Biochemistry</u> , 1995, 34:2471-2479.
	BK	Pyun et al., "Regiospecificity and Isotope Effects Associated with the Methyl-Methylene Eliminations in the Enzyme-Catalyzed Biosynthesis of (R)- and (S)-Limonene," <u>J. Org. Chem.</u> , 1993, 58(15):3998-4009.
	BL	Anderson et al., "Farnesyl Diphosphate Synthetase - Molecular Cloning, Sequence, and Expression of an Essential Gene From <i>Saccharomyces cerevisiae</i> ," <u>J. Biol. Chem.</u> , 1989, 264(32):19176-19184.
L4C	BM	Song et al., "Yeast farnesyl-diphosphate synthase: Site-directed mutagenesis of residues in highly conserved prenyltransferase domains I and II," <u>Proc. Natl. Acad. Sci. USA</u> , 1994, 91:3044-3048.

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LAC	BN	Ohnuma et al., "A Role of the Amino Acid Residue Located on the Fifth Position before the First Aspartate-rich Motif of Farnesyl Diphosphate Synthase on Determination of the Final Product," <u>J. Biol. Chem.</u> , 1996, 271(48):30748-30754.
	BO	Tarshis et al., "Regulation of product chain length by isoprenyl diphosphate synthases," <u>Proc. Natl. Acad. Sci. USA</u> , 1996, 93:15018-15023.
	BP	Tarshis et al., "Crystal Structure of Recombinant Farnesyl Diphosphate Synthase at 2.6-Å Resolution," <u>Biochemistry</u> , 1994, 33:10871-10877.
	BQ	Mau et al., "Cloning of casbene synthase cDNA: Evidence for conserved structural features among terpenoid cyclases in plants," <u>Proc. Natl. Acad. Sci. USA</u> , 1994, 91:8497-8501.
	BR	Wendt et al., "Structure and Function of a Squalene Cyclase," <u>Science</u> , 1997, 277:1811-1815.
	BS	Cane et al., "Trichodiene Synthase. Identification of Active Site Residues by Site-Directed Mutagenesis," <u>Biochemistry</u> , 1995, 34:2480-2488.
	BT	Cane et al., "Trichodiene Biosynthesis and the Stereochemistry of the Enzymatic Cyclization of Farnesyl Pyrophosphate," <u>Bioorg. Chem.</u> , 1985, 13(3):246-265.
	BU	Wheeler et al., "Direct demonstration of the isomerization component of the monoterpene cyclase reaction using a cyclopropylcarbinyl pyrophosphate substrate analog," <u>Proc. Natl. Acad. Sci. USA</u> , 1987, 84(14):4856-4859.
	BV	Pyun et al., "Stereochemistry of the Proton Elimination in the Formation of (+)- and (-)- α -Pinene by Monoterpene Cyclases from Sage (<i>Salvia officinalis</i>)," <u>Arch. Biochem. Biophys.</u> , 1994, 308(2):488-496.
	BW	Croteau, "Evidence for the Ionization Steps in Monoterpene Cyclization Reactions Using 2-Fluorogeranyl and 2-Fluorolinalyl Pyrophosphates as Substrates," <u>Arch. Biochem. Biophys.</u> , 1986, 251(2):777-782.
	BX	Croteau et al., "Irreversible Inactivation of Monoterpene Cyclases by a Mechanism-Based Inhibitor," <u>Arch. Biochem. Biophys.</u> , 1993, 307(2):397-404.
	BY	Rajaonarivony et al., "Characterization and Mechanism of (4S)-Limonene Synthase, A Monoterpene Cyclase from the Glandular Trichomes of Peppermint (<i>Mentha X piperita</i>)," <u>Arch. Biochem. Biophys.</u> , 1992, 296(1):49-57.
	BZ	Rajaonarivony et al., "Evidence for an Essential Histidine Residue in 4S-Limonene Synthase and Other Terpene Cyclases," <u>Arch. Biochem. Biophys.</u> , 1992, 299(1):77-82.
	CA	Aleshin et al., "Refined Crystal Structures of Glucoamylase from <i>Aspergillus awamori</i> var. X100," <u>J. Mol. Biol.</u> , 1994, 238:575-591.
	CB	Juy et al., "Three-dimensional structure of a thermostable bacterial cellulase," <u>Nature</u> , 1992, 357(6373):89-91.
	CC	Altschul et al., "Gapped BLAST and PSI-BLAST: a new generation of protein database search programs," <u>Nucleic Acids Res.</u> , 1997, 25(17):3389-3402.
	CD	Back, et al., "Expression of a Plant Sesquiterpene Cyclase Gene in <i>Escherichia coli</i> ," <u>Arch. Biochem. Biophys.</u> , 1994, 315(2):527-532.
↓	CE	Cane, "Enzymatic Formation of Sesquiterpenes," <u>Chem. Rev.</u> , 1990, 90:1089-1103.
LAC	CF	Cane et al., "Aristolochene Biosynthesis and Enzymatic Cyclization of Farnesyl Pyrophosphate," <u>J. Am. Chem. Soc.</u> , 1989, 111:8914-8916.

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LAC	CG	Cane et al., "Overexpression in <i>Escherichia coli</i> of Soluble Aristolochene Synthase from <i>Penicillium roqueforti</i> ," <i>Arch. Biochem. Biophys.</i> , 1993, 304(2):415-419.
	CH	Hohn et al., "Purification and Characterization of the Sesquiterpene Cyclase Aristolochene Synthase from <i>Penicillium roqueforti</i> ," <i>Arch. Biochem. Biophys.</i> , 1989, 272(1):137-143.
	CI	Laskovics et al., "Prenyltransferase: Determination of the Binding Mechanism and Individual Kinetic Constants for Farnesylpyrophosphate Synthetase by Rapid Quench and Isotope Partitioning Experiments," <i>Biochemistry</i> , 1981, 20(7):1893-1901.
	CJ	Lesburg et al., "Crystal Structure of Pentalenene Synthase: Mechanistic Insights on Terpenoid Cyclization Reactions in Biology," <i>Science</i> , 1997, 277(5333):1820-1824.
	CK	Munck et al., "Purification and Characterization of the Sesquiterpene Cyclase Patchoulol Synthase from <i>Pogostemon cablin</i> ," <i>Arch. Biochem. Biophys.</i> , 1990, 282(1):58-64.
	CL	Proctor et al., "Aristolochene Synthase. Isolation, characterization, and bacterial expression of a sesquiterpenoid biosynthetic gene (<i>Ari1</i>) from <i>Penicillium roqueforti</i> ," <i>J. Biol. Chem.</i> , 1993, 268(6):4543-4548.
	CM	Vogel et al., "Abietadiene Synthase from Grand Fir (<i>Abies grandis</i>)", <i>J. Biol. Chem.</i> , 1996, 271(38):23262-23268
	CN	Bohlmann et al., "Monoterpene Synthases from Grand Fir (<i>Abies grandis</i>)", <i>J. Biol. Chem.</i> , 1997, 272(35):21784-21792.
	CO	Starks et al., "Structural Basis for Cyclic Terpene Biosynthesis by Tobacco 5-Epi-Aristolochene Synthase", <i>Science</i> , 1997, 277:1815-1819.
	CP	Genbank Accession No: Q40577
	CQ	Genbank Accession No: AB022598
	CR	Genbank Accession No: Y18484
	CS	Genbank Accession No: U48796
	CT	Genbank Accession No: AF035631
	CU	Genbank Accession No: L13459
	CV	Genbank Accession No: AF051901
	CW	Genbank Accession No: AF051900
	CX	Genbank Accession No: AF051899
	CY	Genbank Accession No: AF006194
	CZ	Genbank Accession No: U92267
	DA	Genbank Accession No: U92266
	DB	Genbank Accession No: AF024615
V	DC	Genbank Accession No: U87909
LAC	DD	Genbank Accession No: U87908

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LAC	DE	Genbank Accession No: AF006193
	DF	Genbank Accession No: U50768
	DG	Genbank Accession No: L32134
	DH	Genbank Accession No: AF006195
	DI	Genbank Accession No: AJ005588
	DJ	Genbank Accession No: Q43714
	DK	Genbank Accession No: AF061285
	DL	Genbank Accession No: AF043299
	DM	Genbank Accession No: AB022719
	DN	Genbank Accession No: AB023816
	DO	Genbank Accession No: AF043298
	DP	Genbank Accession No: AF043300
	DQ	Genbank Accession No: AF042382
	DR	Genbank Accession No: B56118
	DS	Genbank Accession No: C56118
	DT	Genbank Accession No: U20187
✓	DU	Genbank Accession No: U20189
LAC	DV	Genbank Accession No: U20190

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